

## CLAIMS

What is claimed is:

1. A wireless transmit/receive unit (WTRU) for infrastructure communication in a wireless network via network base stations and for peer-to-peer communications with other such WTRUs comprising:

transceiver components that are configured for selective operation in an infrastructure communication mode for infrastructure communication with a network base station and in a peer-to-peer communications mode for peer-to-peer communications with other WTRUs; and

a transceiver controller configured to selectively control peer-to-peer mode communications with other WTRUs based on communication signals received in infrastructure communications with a network base station.

2. The invention of claim 1 wherein the transceiver controller is configured with selected default control limits for peer-to-peer mode communications that can be overridden based on communication signals received in infrastructure communications with a network base station.

3. The invention of claim 2 wherein the transceiver controller selected default control limits for peer-to-peer mode communications include a maximum duration of a peer-to-peer communication and a restriction as to types of data traffic permitted in peer-to-peer communications.

4. The invention of claim 1 wherein the transceiver components include a wireless local area network (WLAN) modem for the peer-to-peer communications with other WTRUs.

5. The invention of claim 1 wherein the transceiver controller is configured to control the transceiver components to switch between infrastructure

communication mode and peer-to-peer communication mode based on Quality of Service criteria.

6. The invention of claim 1 wherein the WTRU is a mobile unit and the transceiver controller is configured to control the transceiver components to switch between infrastructure communication mode and peer-to-peer communication mode based on an estimate of the geographic location of the mobile unit.

7. The invention of claim 6 further comprising a Global Positioning System (GPS) for generating the estimate of the geographic location of the mobile unit.

8. The invention of claim 1 wherein the transceiver components are configured to selectively function in a relay mode to relay a communication between a network base station via infrastructure communication mode and another WTRU via peer-to-peer communication mode, and the transceiver controller is configured to control the transceiver components to function in the relay mode to based on Quality of Service criteria.

9. The invention of claim 1 wherein the transceiver controller is configured to control each peer-to-peer mode communications based on settings received in infrastructure communications with a network base station.

10. The invention of claim 1 wherein the transceiver controller is configured with selected default control limits for peer-to-peer mode communications.

11. A method of wireless communication for a wireless transmit/receive unit (WTRU) having transceiver components that are configured for selective operation in an infrastructure communication mode for infrastructure

communication in a wireless network via a network base station and in a peer-to-peer communications mode for peer-to-peer communications with other WTRUs also configured for infrastructure communication in the wireless network, the method comprising the step of:

selectively controlling peer-to-peer mode communications with other WTRUs based on communication signals received in infrastructure communications with a network base station.

12. The method of claim 11 further comprising the step of:

using selected default control limits for peer-to-peer mode communications and overriding said defaults based on communication signals received in infrastructure communications with a network base station.

13. The method of claim 12 wherein a maximum duration of a peer-to-peer communication and a restriction as to types of data traffic permitted in peer-to-peer communications are included as the default control limits used for peer-to-peer mode communications.

14. The method of claim 11 wherein a wireless local area network (WLAN) modem is used for the peer-to-peer communications with other WTRUs.

15. The method of claim 11 wherein the transceiver components are switched between infrastructure communication mode and peer-to-peer communication mode based on Quality of Service criteria.

16. The method of claim 11 wherein the WTRU is a mobile unit and the transceiver components are switched between infrastructure communication mode and peer-to-peer communication mode based on an estimate of the geographic location of the mobile unit and/or an estimate of congestion.

17. The method of claim 16 wherein the WTRU includes a Global Positioning System (GPS), the method further comprising the step of using the GPS for generating the estimate of the geographic location of the mobile unit and sending test packets from the WTRU to generate an estimate of congestion.

18. The method of claim 11 wherein the transceiver components are configured to selectively function in a relay mode to relay a communication between a network base station via infrastructure communication mode and another WTRU via peer-to-peer communication mode, the method further comprising the step of controlling the transceiver components to function in the relay mode based on Quality of Service criteria.

19. The method of claim 11 using settings received in infrastructure communications with a network base station to control each peer-to-peer mode communication.

20. A wireless network for providing controlled wireless communications with multi-mode wireless transmit/receive units (WTRUs) that have transceiver components configured for selective operation in an infrastructure communication mode for infrastructure communication in the wireless network and in a peer-to-peer communications mode for peer-to-peer communications with other WTRUs also configured for infrastructure communication in the wireless network, the wireless network comprising:

at least one base station having a transceiver configured for selective operation in an infrastructure communication mode with multi-mode WTRUs; and

a controller configured to selectively control transmission of control signals via infrastructure communications with a WTRU to control peer-to-peer mode communications of that WTRU with other WTRUs.

21. The invention of claim 20 wherein the controller is configured provide override control signals to override selected default WTRU control limits for peer-to-peer mode communications.

22. The invention of claim 20 wherein the WTRUs include a wireless local area network (WLAN) modem for the peer-to-peer communications with other WTRUs and the controller is configured to selectively control transmission of control signals via infrastructure communications with a WTRU to control WLAN peer-to-peer mode communications of that WTRU with other WTRUs.

23. The invention of claim 20 wherein the controller is configured to selectively control transmission of control signals via infrastructure communications with a WTRU to control that WTRU to switch between infrastructure communication mode and peer-to-peer communication mode based on Quality of Service criteria.

24. The invention of claim 20 wherein at least some of the WTRUs are mobile units and the controller configured to selectively control transmission of control signals via infrastructure communications with a mobile unit to control that mobile unit to switch between infrastructure communication mode and peer-to-peer communication mode based on an estimate of the geographic location of the mobile unit.

25. The invention of claim 23 further comprising a processing component for generating the estimate of the geographic location of the mobile unit based on reception of transmissions from the mobile unit.

26. A method of wireless communication for a wireless network that provides controlled wireless communications with multi-mode wireless transmit/receive units (WTRUs) that have transceiver components configured for

selective operation in an infrastructure communication mode for infrastructure communication in the wireless network and in a peer-to-peer communications mode for peer-to-peer communications with other WTRUs also configured for infrastructure communication in the wireless network, the method comprising the step of:

transmitting from a network base station in an infrastructure communication mode control signals to a WTRU to control peer-to-peer mode communications of that WTRU with other WTRUs.

27. The method of claim 26 further comprising the step of using selected default control limits for peer-to-peer mode communications and overriding said defaults based the control signals transmitted by the network base station.

28. The method of claim 27 wherein a maximum duration of a peer-to-peer communication and a restriction as to types of data traffic permitted in peer-to-peer communications are included as the default control limits used for peer-to-peer mode communications.

29. The method of claim 26 wherein wireless local area network (WLAN) modems are used for the WTRU peer-to-peer communications.

30. The method of claim 26 wherein the control signals are transmitted to the WTRU to switch between infrastructure communication mode and peer-to-peer communication mode based on Quality of Service criteria.

31. The method of claim 26 wherein the WTRU is a mobile unit and the control signals are transmitted to the mobile unit to switch between infrastructure communication mode and peer-to-peer communication mode based on an estimate of the geographic location of the mobile unit.

32. The method of claim 31 wherein the estimate of the geographic location of the mobile unit is generated based on signals received from the mobile unit by the network base station.

33. The method of claim 26 wherein the WTRU is configured to selectively function in a relay mode to relay a communication between a network base station via infrastructure communication mode and another WTRU via peer-to-peer communication mode further comprising controlling the WTRU to function in the relay mode based on Quality of Service criteria.